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ABSTRACT

The study examined the relationship between performance on the K-ABC (Kaufman Assessment Battery for Children) and the WISC-R (Wechsler Intelligence Scale for Children--Revised) for 67 students being considered for placement in a private school in a midwestern metropolitan area that serves students with severe learning disabilities. All were referred for evaluation as a result of serious academic or academic/behavioral problems. Of the 67 students referred, 32 were identified as severely learning disabled (LD) and were accepted for placement in the school and 35 were not accepted but were diagnosed as emotionally disturbed, behaviorally disordered, educably mentally retarded, or were nonhandicapped. As a part of the diagnostic process all 67 were administered both the K-ABC and WISC-R in counterbalanced order. The correlational results of the study documented strong relationships among all of the global standard scores on both instruments. Individual performance patterns for the LD students showed a tendency for scores on the Simultaneous subtest to be greater than scores on the Sequential Processing and Performance IQ subtests which themselves tended to be higher than the Verbal IQ subtest scores. (CL)

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K-ABC/WISC-R Relationships for Students Referred for Severe Learning Disabilities

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ABSTRACT

This study examined the relationship between performance on the K-ABC and the WISC-R for 67 students referred for evaluation as a result of serious academic or academic/behavioral problems. Of the 67 students referred, 32 were identified as severely learning disabled (LD) and 35 were not. The correlational results of the study documented strong relationships among all of the global standard scores on both instruments (r = .65 to .95). Individual performance patterns obtained reflected a preponderance of Simultaneous > Sequential processing and Performance IQ > Verbal IQ profiles for the LD students, but not for the non-LD group. The results of t-tests also confirmed Simultaneous > Sequential, Mental Processing Composite > Achievement and Performance IQ > Verbal IQ differences for the LD group.

The Kaufman Assessment Battery for Children (K-ABC; Kaufman and Kaufman, 1983) is a recently developed instrument designed to measure intelligence and achievement in children ages 2 1/2 to 12 1/2. The K-ABC defines intelligence as "an individual's style of solving problems and processing information" (p. 2). Achievement is assessed by tasks similar to many of the verbal items on the Wechsler Intelligence Scale for Children-Revised (WISC-R).

The authors of the K-ABC assert that the instrument is useful in diagnosing learning disabilities (LD) since LD students were included in the standardization sample, the battery includes both intelligence and achievement measures and the results can be used to generate teaching strategies based on the individual student's style of processing information. Additionally, they state that "low levels of sequential or successive processing may be associated with poor reading performance for mentally retarded and learning disabled children" (p. 11).

In the Interpretive Manual for the K-ABC, 43 validity studies are described. Most of these studies relate K-ABC scores with either WISC-R or Stanford Binet scores for normal or previously identified handicapped students. Several additional studies examining LD students' performance on the K-ABC and other measures have recently been reported (Haddad, 1984; Obrzut, Obrzut & Shaw, 1984; Naglieri, 1984; and Naglieri & Haddad, 1984). Unfortunately, most of them have been characterized by small

sample sizes, a lack of distinction regarding the severity of the learning disabilities examined, or a failure to report whether the subjects were previously identified LD students or students recently referred for evaluation. Despite these limitations, all of the studies have documented a strong relationship between the Mental Processing Composite (MPC) on the K-ABC and the WISC-R Full Scale IQ (FSIQ). In addition to this finding of a strong MPC-FSIQ relationship, one recent study (Klanderman, Perney & Kroeschell, 1985) has also reported no significant difference between Simultaneous (SIM) and Sequential (SEQ) processing for a group of identified LD students. However, there remains a need to examine the relationship among performance on the K-ABC and other measures of intelligence using samples of referred students rather than groups of students previously identified as handicapped.

The purposes of the present study were (1) to examine differences in K-ABC performance between students placed in a self contained LD program and students not identified as LD and (2) to examine the relationship between performance on the K-ABC and WISC-R for students identified as LD.

METHOD

Subjects

The subjects for the study consisted of 67 students referred for psychological evaluation as a result of serious academic or academic/behavioral problems. All of the

students were being considered for placement in a private school located in a midwestern metropolitan area and serving students with severe learning disabilities. The evaluations were conducted by two certified school psychologists on the school staff, both of whom had received training in WISC-R and K-ABC administration and interpretation. The subjects ranged in age from 6 to 12 1/2 and were in the first through seventh grades. Of the 67 students referred, 32 were identified as LD and accepted for placement; the remaining 35 were diagnosed as emotionally disturbed (ED), behaviorally disordered (BD), educably mentally retarded (EMR) or were nonhandicapped. The sample consisted of 40 males and 27 females.

Procedure

As a part of the diagnostic process, all 67 students were administered both the K-ABC and WISC-R in counterbalanced order as well as a variety of other instruments according to the nature of the referral.

In order to compare performance on the K-ABC and WISC-R between the LD and non-LD groups, *t* tests for independent samples were performed on each of the global standard scores. Pearson product moment correlations were calculated on the global standard scores of both instruments for each group. A chi-square analysis was performed to examine differences in performance patterns. To further examine differences in global scores among the LD students, *t* tests

for related samples were conducted on the global standard scores of both the K-ABC and WISC-R.

RESULTS

The descriptive results of the study are presented in Table 1. On the K-ABC, the mean MPC, SEQ and SIM scores were in the average range for both the LD and non-LD groups. The Achievement (ACH) score was in the average range for the non-LD group and in the low average range for the LD group. The mean SIM score was higher than the mean SEQ score for both groups (8 standard score points higher for the LD group and 4 standard score points higher for the non-LD group). In addition, the MPC was approximately 4 points higher than the ACH score for both groups. On the WISC-R, the mean Verbal IQ (VIQ), Performance IQ (PIQ) and FSIQ were in the average range for both groups. The LD group, however, displayed a PIQ>VIQ pattern, whereas the non-LD group displayed a VIQ>PIQ pattern.

Insert Table 1 about here

The results of *t* tests for independent samples performed on each of the global standard score means (MPC, SEQ, SIM, ACH, FSIQ, VIQ and PIQ) yielded no significant differences between the LD and non-LD groups.

The correlational results of the study are presented in Tables 2, 3 and 4. Table 2 provides the intercorrelations for the four K-ABC global scales and Table 3 provides the intercorrelations for the WISC-R global scales. Correlations among the K-ABC and WISC-R global scales are presented in Table 4.

Insert Tables 2, 3 and 4 about here

The correlational results of the study are highly consistent with previous findings with LD students. The intercorrelations on the K-ABC range from .66 to .95, while the intercorrelations on the WISC-R range from .69 to .94. The SIM scale correlates more highly with the MPC than the SEQ scale, due to the greater number of SIM subtests being correlated with themselves as part of the MPC. The correlation between the MPC and ACH scale ($r = .71$) is also consistent with previous findings (e. g. Lyon & Smith, 1986; Naglieri, 1984), indicating that about 49% of the variance in ACH performance can be accounted for by the MPC.

The strong correlation between the MPC and FSIQ ($r = .85$) is consistent with the findings of Naglieri (1984) and somewhat higher than the correlation reported by Klanderman, Perney and Kroeschell (1985). Likewise, the correlation between the FSIQ and ACH ($r = .86$) is consistent with previous studies. Intercorrelations among the global scales

of both instruments range from .65 to .88 and suggest substantial overlap in the constructs measured by the two instruments.

For the 32 subjects classified as severely LD, 12 students (38%) displayed a PIQ>VIQ pattern, 1 student (3%) displayed a VIQ>PIQ pattern, 13 students (41%) displayed a SIM>SEQ pattern, 1 student (4%) displayed a SEQ>SIM pattern and 9 students (28%) displayed a MPC>ACH pattern. For the non-LD subjects, 1 student (3%) displayed a PIQ>VIQ pattern, 6 students (17%) displayed a VIQ>PIQ pattern, 4 students (11%) displayed a SEQ>SIM pattern and 4 students (11%) displayed a MPC>ACH pattern. A chi-square analysis performed on these results was significant (X^2 (4) = 15.66, $p<.01$), primarily due to the large number of students in the LD group with both PIQ>VIQ and SIM>SEQ patterns. Of the 13 students displaying a SIM>SEQ pattern, 12 also had a PIQ>VIQ pattern.

Finally, using only the 32 subjects identified as LD, *t* tests for related samples were performed on the global standard scores of both the K-ABC and the WISC-R. On the K-ABC, the difference between both SEQ and SIM ($t(31) = -4.17$, $p<.001$) and MPC and ACH ($t(31) = 2.09$, $p<.05$) were significant in the expected directions (i.e. SIM>SEQ and MPC>ACH). Similarly on the WISC-R the difference between VIQ and PIQ ($t(31) = -2.74$, $p<.01$) was significant (PIQ>VIQ). The difference between FSIQ and ACH ($t(31) = 3.84$, $p<.001$) was also significant (FSIQ>ACH).

DISCUSSION

For this sample of students with serious academic difficulties, the results indicate strong, positive correlations between a majority of the global scales of the K-ABC and the global scales of the WISC-R. Recent research with LD students in self-contained classes (Klanderman, Perney & Kroeschell, 1985) has indicated strong, positive correlations between VIQ and ACH and substantially lower correlations with SIM, SEQ and MPC. The present study, however, indicates much stronger correlations between VIQ and SIM, SEQ and MPC. In addition, the PIQ was found to correlate with MPC at a higher level than the VIQ ($r = .82$ vs $r = .74$), which is consistent with validity studies reported in the Interpretive Manual. However, the overall MPC/FSIQ correlation of .85 is substantially higher than the correlations for the standardization sample as reported in the Interpretive Manual.

The stronger relationship between MPC and PIQ than between MPC and VIQ is consistent with the validity studies with LD samples reported in the Interpretive Manual, although the magnitude of the correlations is higher with the present sample of severely LD students. In addition, PIQ correlated highest with SIM ($r = .85$), VIQ with ACH ($r = .88$) and FSIQ with ACH ($r = .86$). These results are also consistent with previous research and support Kaufman and Kaufman's (1983) assertion that emphasis is placed on "verbal ability and factual knowledge in determining a

child's global IQ on the WISC-R" (p. 111). The pattern of intercorrelations in the present study is similar to other studies with both normal and exceptional students and supports the construct validity of the K-ABC for students with serious academic difficulties.

Intercorrelations among subscales of the K-ABC and WISC-R are also strongly positive ranging from .66 to .95 for the K-ABC and from .69 to .94 for the WISC-R. As with previous studies, VIQ correlated with FSIQ at a higher level than did PIQ ($r = .94$ vs $r = .91$). On the K-ABC, the SIM-MPC correlation ($r = .95$) was higher than the SEQ-MPC correlation ($r = .88$). A similar pattern was found by Naglieri (1984) using a sample of normal and exceptional children and by Smith and Lyon (1986) using a sample of at-risk preschool children.

Although no significant differences were found between the two groups (severely LD and non-LD) on the global scales of the WISC-R and K-ABC, significant differences were indicated in the way these scores were obtained. Twice as many LD students displayed discrepancies (SIM/SEQ or VIQ/PIQ) as did the non-LD students (44% vs 23% for SIM/SEQ and 41% vs 20% for VIQ/PIQ respectively). For the LD group, 93% of the SIM/SEQ discrepancies were in favor of SIM as compared to 0% for the non-LD group. Likewise, 92% of the VIQ/PIQ discrepancies were in favor of PIQ for the LD group as compared to 14% for the non-LD group. All 12 LD students displaying a PIQ>VIQ had a SIM>SEQ pattern. Thus,

discrepancies in subscale scores were more frequent with students identified as LD as compared to students with similar academic difficulties but not identified as LD.

Since such discrepancies occurred in about 45% of the cases, caution is needed in interpreting this finding. Similar patterns have been found in some studies (e.g. Gunnison et al, 1983; Lyon & Smith, 1985; Naglieri & Pfeiffer, 1983; Obrzut & Obrzut, 1983) while other studies have found approximately equal proportions of LD students with SIM>SEQ and SEQ>SIM patterns (e.g. Klanderman et al, 1985; Naglieri & Haddad, 1984). Severity of LD, therefore, may be a factor as the present study was composed of students with a history of academic problems and this was not necessarily the case with previous studies.

The results raise the question as to whether the SIM preference of the LD group may not match the instructional approach of the traditional classroom. Kaufman and Kaufman (1983) originally hypothesized that a preponderance of LD students might display this SIM preference. Results of studies with LD students have been inconsistent as there are differences in classification criteria and severity. With the present sample of severely LD students, there is support for this hypothesis. If the hypothesis is valid, the instruction tailored to the student's processing preference might be effective. Clearly, further research is needed to clarify these issues.

Analysis of the LD students' performance on the K-ABC and WISC-R indicate these characteristics: SIM scores higher than SEQ scores, MPC higher than ACH, VIQ higher than PIQ and FSIQ higher than ACH. These results are consistent with previous studies of LD students and seem to reflect the lesser developed verbal skills and achievement difficulties. The LD sample earned the highest mean subtest scores on Triangles (mean = 11.03), Gestalt Closure (mean = 10.38), Matrix Analogies (mean = 9.72) and Riddles (mean = 98.88). Lowest scores were Spatial Memory (mean = 8.25), Word Order (mean = 8.03), Reading/Decoding (mean = 86.47) and Reading/Understanding (mean = 89.34). These patterns are remarkably consistent with the patterns reported by Kaufman and Kaufman (1983) for LD students. Finally, when a processing preference is indicated, it is more likely to be a SIM preference as opposed to SEQ.

The differing performance patterns between the LD and the non-LD groups on the K-ABC may be useful for not only diagnosis of LD but also programming. Since a major purpose of the K-ABC was to develop effective intervention strategies, the usefulness of the test will likely depend on its effectiveness in accomplishing this goal. Therefore, the effectiveness of teaching LD students through their processing preference demands research attention and the outcome of such research will greatly affect the usefulness of the K-ABC.

At the same time 11% of the non-LD students displayed a processing preference (SIM or SEQ) as compared to about 50% of normal children in the standardization sample. Kaufman and Kaufman (1983) have noted that lack of a processing preference on the K-ABC for groups of students may also be significant particularly when both mental processing scores (SIM and SEQ) are near the Below Average range or lower. It is possible that in such situations, learners lack a viable means of compensating for weaker skills in one area by capitalizing on strengths in the other area. This issue clearly demands further investigation.

The results of this study accord well with previous research on the K-ABC and WISC-R for LD students. Strong correlations are indicated between the MPC and the WISC-R Full Scale IQ. In addition, the strong correlations between the K-ABC ACH scale and the WISC-R FSIQ and VIQ lend support to the hypothesis that the WISC-R also measures achievement behavior.

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Table 1

Means, Standard Deviations, and Minimum and Maximum Values for the Global Scales on the WISC-R and K-ABC

Variable	Mean	SD	Min-Max
Full Scale IQ			
LD group	97.23	13.05	72-129
Non-LD group	101.07	20.70	40-134
Verbal IQ			
LD group	94.45	11.37	73-123
Non-LD group	102.10	21.31	45-140
Performance IQ			
LD group	100.81	15.28	65-130
Non-LD group	99.03	17.97	45-121
MPC			
LD group	94.16	13.87	68-119
Non-LD group	97.97	19.40	49-117
Sequential			
LD group	90.03	11.60	64-112
Non-LD group	95.56	20.96	42-126
Simultaneous			
LD group	98.13	14.49	71-129
Non-LD group	99.55	17.62	55-121
Achievement			
LD group	89.84	8.93	69-107
Non-LD group	94.10	19.79	44-125

Table 2

Intercorrelations among the K-ABC Global Scales

Variable	SEQ	SIM	ACH
MPC	.88*	.95*	.71*
SEQ		.71*	.67*
SIM			.66*

*p < .001

Table 3

Intercorrelations among the WISC-R Global Scales

Variable	VIQ	PIQ
FSIQ	.94*	.91*
VIQ		.69*

*p < .001

Table 4

Correlations among the Global Scales of the K-ABC and WISC-R

Variable	MPC	SEQ	SIM	ACH
FSIQ	.85*	.77*	.81*	.86*
VIQ	.74*	.76*	.65*	.88*
PIQ	.82*	.65*	.85*	.69*

*p < .001